

"the history of no people can be said to have been written so long as its superstitions and beliefs in past times have not been studied; and those who think that the legends here recorded are childish and frivolous, may rest assured that they bear on questions which could not themselves be called either childish or frivolous."

Further on he returns to the subject:

"With regard to him," he says, "who looks at the collecting and the studying of folk-lore as trivial work and a waste of time, I should gather that he regards it so on account, first perhaps, of his forgetting the reality their superstitions were to those who believed in them; and secondly, on account of his ignorance of their meaning. As a reality to those who believed in them, the superstitions of our ancestors form an integral part of their history. However, I need not follow that topic further by trying to show how 'the proper study of mankind is man,' and how it is a mark of an uncultured people not to know or care about the history of the race. So the Roman historian, Tacitus, evidently thought; for, when complaining how little was known as to the original peopling of Britain, he adds the suggestive words *ut inter barbaros* 'as usual among barbarians.' Conversely, I take it for granted that no liberally educated man or woman of the present day requires to be instructed as to the value of the study of history in all its aspects, or to be told that folk-lore cannot be justly called trivial, seeing that it has to do with the history of the race—in a wider sense, I may say, with the history of the human mind and the record of its development."

There are many scientific men who need to lay to heart this protest.

A full index is given, and a most useful bibliographical list of references.

E. SIDNEY HARTLAND.

ALKALOIDS.

Die Pflanzen-Alkaloide. By Jul. Wilh. Brühl, Professor in the University of Heidelberg, and Eduard Hjelt and Ossian Aschan, Professors in the University of Helsingfors. Pp. xxii+586. (Brunswick: Friedrich Vieweg und Sohn, 1900.) Price Mk. 14.

THE progress that has been made in the rapidly developing fields of organic chemistry can be best estimated when recognised authorities, such as the authors of the present volume, furnish chemists with special monographs dealing with those groups of compounds in which the writers can lay claim to an expert knowledge. As a class the vegetable alkaloids, which are dealt with in this volume, are of exceptional interest, not only on account of their wide distribution as natural products, but also because of their remarkable physiological actions. It is interesting to note, in reading through this admirable summary of the existing state of knowledge in this branch of chemistry, what great strides have been made towards a more definite conception of the structure or "constitution" of the molecules of these compounds within the last few years. At the present time, the synthetical achievements in this field are not numerous. The first complete synthesis of an alkaloid was that of coniine by Ladenburg in 1886, followed soon after by the synthesis of trigonelline by Hantzsch and Jahns. The latter chemist succeeded in synthesising arecoline in 1891, and the synthesis of piperine from

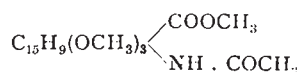
piperidine and piperic acid by Ladenburg and Scholtz in 1894 may be said to complete the list of total syntheses thus far accomplished. But several partial syntheses have to be recorded, viz. aconitine from aconine and methyl benzoate, cocaine from ecgonine and benzoic anhydride; and one step towards the synthesis of hydrastine was made in 1895 by Fritsch.

The effect of this more intimate knowledge of the chemical constitution of the alkaloids is evident in the classification adopted in the present work. It is, in fact, now possible to refer large numbers of these compounds to different groups, each group having a well-known organic base as its parent form. Every one of the four parent compounds, viz. pyrrolidine, pyridine, quinoline and isoquinoline, are, it may be of interest to point out, capable of being completely synthesised. A brief sketch of the mode of treatment will enable our readers to form an idea of the value of this monograph by Prof. Brühl and his colleagues.

The introductory chapter deals with the history, distribution, preparation and properties, modes of decomposition, synthesis, physiological action, detection and estimation, and other general considerations relating to the group as a whole. This is followed by the chapter on the alkaloids of the pyrrolidine group, which comprises the hygrines and cuskhygrine. The second chapter contains an account of the alkaloids of the pyridine group, the latter comprising twelve subdivisions trigonelline, the jaborandi alkaloids, areca alkaloids, conium alkaloids, piperine, chrysanthemine, nicotine, solanum bases such as atropine, hyoscyamine, tropacocaine, madragorine, &c.; the alkaloids of coca, the alkaloids of pomegranate root-bark, sparteine and cytisine. The third chapter comprises the quinoline group, and, although divided into only two subdivisions, is very rich in individual compounds, since it includes the very numerous cinchona alkaloids and those of the plants belonging to the genus *Strychnos*. In the fourth chapter, the authors treat of the alkaloids of the isoquinoline group, comprising more than twenty opium alkaloids, hydrastine and canadine, and the alkaloids of *Berberis* and *Corydalis*.

The four chapters, the contents of which have been briefly referred to, deal with those alkaloids which are susceptible of chemical classification by virtue of our knowledge of their constitution. Whether with the progress of chemical science any or all of these formulæ may not require modification—and many of them are confessedly but tentative—does not affect the main question as to the atomic complexes from which the various alkaloids are derivable, and the reference of a particular alkaloid to any one of the four groups may be looked upon as a definite allocation of the compound with reference to its parent complex, whether the latter is genetically connected with its derivative by actual laboratory processes or whether the connection has only been inferred by indirect methods. The remaining alkaloids, which are distributed through the sixteen subdivisions constituting the fifth and last chapter, are, however, classified botanically rather than chemically, since their chemical constitution is unknown and only empirical formulæ can at present be assigned. Thus we

have alkaloids from cryptogamic plants such as ergotinine, lycopodine and pilljanine, and then following these the alkaloids from twelve families of flowering plants, viz. Coniferae and Gnetaceae, Liliaceae, Apocynaceae, Aristolochiaceae, Buxaceae, Lauraceae, Papilionaceae, Loganiaceae, Papaveraceae, Ranunculaceae, Rubiaceae and Rutaceae. A number of odd alkaloids and a few glyco-alkaloids conclude the work. In some of the numerous alkaloids considered as of unknown constitution, a certain amount of knowledge may be said to have been acquired in the direction of structural formulation. To illustrate this point, consider, for example, colchicine from *Colchicum autumnale*, which is empirically written $C_{22}H_{25}NO_6$. It is known, chiefly through the researches of Zeisel, that this alkaloid is a methyl ester containing four methoxy-groups and one acetamino-group. Its formula thus becomes:—



and it is obviously a derivative of a phenolic amino-acid. But the constitution of the hydrocarbon complex $C_{15}H_9$ is still unknown, and the placing of the compound among the alkaloids of unknown constitution is thus justified. It is of interest to note in passing, as an illustration of the richness of this field of plant chemistry, that in this fifth chapter alone more than one hundred alkaloids of unknown constitution, but which are nevertheless definite chemical "individuals," are treated of. It may be further mentioned that under the term glyco-alkaloids the authors comprise compounds such as achilleine, solanine, moschatine and vicine, which split up on hydrolysis into glucose and a base.

A work such as that which forms the subject of the present notice cannot be criticised as a literary production. It belongs to that class of books which, being of the nature of monographs, are absolutely indispensable to all who are interested in the progress of organic chemistry, whether as students, investigators, teachers, pharmacologists or manufacturers. It sums up and presents in a systematised form the achievements of research in this particular field, and as a special work it may be said to have no competitor since, as the authors point out in the preface, the standard works on this subject by Pictet (1891) and Guareschi (1896) are already behind the actual state of knowledge in this domain, the boundaries of which are being extended with such astonishing rapidity. In writings of this class, where chemical compounds are dealt with from the historical point of view as well as from the most recent standpoint, there is often a tendency to spin out the history in wearisome detail. No fault can be found on this score with the authors' treatment; their general histories, as well as their histories of the individual alkaloids, are marvels of succinctness. We have long been in the habit of looking to continental writers for such monographs, and if our own specialists have hitherto failed in contributing such standard works to chemical literature, there is some compensating satisfaction in the present case, since the volume under notice is a special contribution to the German edition of an English work, viz. Roscoe and Schorlemmer's well-known "Treatise on Chemistry."

R. MELDOLA.

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SOUNDINGS IN THE NORTH ATLANTIC.

On the Results of a Deep-Sea Sounding Expedition in the North Atlantic during the Summer of 1899. By R. E. Peake, M.Inst.C.E. With Notes on the Temperature Observations and Depths, and a Description of the Deep-Sea Deposits in this Area. By Sir John Murray, K.C.B., F.R.S. Pp. 44. (London: John Murray, 1901.) Price 5s.

THIS little book, the latest of the "Extra Publications" of the Royal Geographical Society, ought effectually to attain at least one of its main objects, which is "to call attention to the assistance that Telegraph Cable Companies render towards improving our knowledge of the character and condition of the ocean's bed." The immense amount of valuable work done at sea every day by the commanders and officers of all kinds of ships deserves far more cordial recognition than it usually receives, especially in this country. The ordinary navigation of a ship involves daily observations of quite as great difficulty and complexity as any in the routine scientific work of a deep-sea expedition, and sailors not only have done, and do, much in the way of special observations of all kinds, but they are able and willing to do more. All they need is to be told what is wanted, and to be encouraged occasionally by satisfactory evidence that their labour is not thrown away. It may be hoped that the inauguration of the British Pilot Chart of the North Atlantic, and the publication of a paper like the present by the Royal Geographical Society, will lead to still fuller recognition of what must probably remain the only available methods of systematic and continuous investigation in ocean meteorology and oceanography.

The expedition here described was sent out to survey routes of cables which the Deutsch-Atlantisch Telegraphengesellschaft and the Commercial Cable Company had decided to lay; the former between Germany, the Azores and New York, and the latter between Ireland, the Azores and Nova Scotia. The preliminary survey was undertaken on the advice of Messrs. Clarke, Forde and Taylor, engineers to the companies. Mr. Peake was responsible for the plan of the survey and the supervision of the operations, and the work was carried out by the Telegraph Construction and Maintenance Company's s.s. *Britannia*, Captain H. Woodcock. The *Britannia* left England on May 4, 1899, and returned on August 3, having made 477 soundings, from most of which samples of the bottom were obtained, and 150 observations of bottom temperature. A large number of current observations were also recorded. The route is described as follows:—A large number of soundings were first taken between Fayal and Flores, on the Azores bank; next a line from south of Flores to New York; then a line from Cape Canso, Nova Scotia, towards the north of Flores. Different parts of the Azores bank were then surveyed in detail, and a line run to the coast of Ireland; and finally the ship returned to the Azores bank and sounded north-eastward to the mouth of the English Channel.

The results of the expedition are dealt with under four heads—depths, bottom temperatures, currents, and